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natural product on a water bath until it is hard, but not brittle, when cool. Then dissolve in a menstruum such as chloroform or xylol. After balsam is applied to the slide allow to stand over-night and then finish by placing cover glass over the sections, using gentle heat to render the balsam fluid. This mounting medium will then be found to be hard enough to withstand any pressure applied on the cover glass by careless students.

It is advisable to prepare this balsam oneself, unless it can be procured from a reliable firm which uses the above method of preparation.

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THE HISTORY OF SCIENCE

RELATIVE to your recent articles on the history of science and its present position in American colleges, you might be interested to know that efforts are being made to adapt the history of science as a cultural course for engineering students. I taught such a course in the college of engineering of the University of Colorado, and now am teaching it in the college of engineering of New York University.

PHILIP B. McDONALD

DECEMBER 27, 1921.

AMEBOID BODIES ASSOCIATED WITH HIPPEASTRUM MOSAIC

In a recent publication¹ the writer described and pictured certain bodies in the cells of corn plants suffering from mosaic disease. Since the bodies are confined to diseased portions of the plant, it was suggested that they might be of etiological significance.

Those who are working on the mosaic disease problem will be interested to know that similar bodies have now been found in the light green portions of mosaic leaves of *Hippeastrum equéstre* Herb. This plant belongs in the Amaryllidaceae and is not closely related to corn. Its leaves which are thick and soft are well suited for cytological studies. The mosaic

pattern shown by *Hippeastrum* is quite different from that of corn. The intracellular bodies associated with this disease will be described in detail in a future paper.

L. O. KUNKEL

EXPERIMENT STATION OF THE HAWAIIAN SUGAR
PLANTERS' ASSOCIATION,
HONOLULU, T. H.

THE TUNING FORK

IN SCIENCE for November 11, I cited briefly some inadequate references to the actions of a tuning fork to justify the preservation of matter that was very old; there was no reason to name the writers for these references were minor parts of their papers. But in SCIENCE for December 16, one of the writers, Mr. Young, comes to the front, as if I had made a personal attack on him, and defends his former expressions, but qualifies them, still leaving the subject in a very confused state. He quotes his former dynamically unsound "statement that the fork has only a single note at the base" and now adds the indefinite remark, "This of course is only an approximation"; it is noteworthy that he does not attempt to state what he thinks is the truth.

In his final paragraph he attributes to Professor Watson an "alternative explanation" which is only a corollary of Chladni's old accepted theory; but probably the professor of physics would not use over his own signature such an inexact expression as the "center of mass tends to rise" or "lower," or leave it doubtful whether "center of mass" always relates to the same point.

CHARLES K. WEAD

QUOTATIONS

"KEY" CHEMICALS

LORD CREWE and Lord Haldane argued last week for the release of scientific apparatus and chemicals from the restrictions imposed by the safeguarding of industries act and the reparation act. Scientific research and the teaching of scientific students, they alleged, were seriously impeded because of the delay and difficulty in importing certain chemicals and apparatus from Germany. The stronger

¹ Bul. Exp. Sta. H. S. P. A. 3:44-58 (1921)

the evidence for their case, the more certainly does it lead away from the action they pressed on the government. Although protection may be dubious as a general principle, there are certain industries of little intrinsic economic importance, and yet vital to the national safety, because of the dependence of larger industries upon them. Are there any avocations more certainly "keys" to national prosperity than scientific research and the training of scientific workers? In these matters we must depend neither on Germany nor on any foreign country. If dependence exist at present, the administration of the acts should be tightened, not relaxed, until we become self-supporting. But the case is probably over-stated. Before the war scientific workers here and in the United States had got in the habit of using such chemicals as bacteriological stains and such forms of optical glass as microscopic lenses from one or two German makers, not because these were better than all others, but because they were standardized and all workers using them could easily compare their results. Convenience, not necessity, had led to a German monopoly. American bacteriologists are endeavoring to meet the state of affairs by agreeing on a reliable standard brand of each kind of stain and discouraging the use of variants. Similar action might be taken in this country not only with regard to stains, but to many other kinds of chemicals and of apparatus used in research. But we note with concern as further witness of the aloofness of the state from science, that the interpellations on this scientific question were addressed to the minister of transport, who undertook, apparently to the satisfaction of every one, to refer it to the president of the Board of Education. Is there not a Royal Society, at one time the natural adviser of the government on scientific matters?—*The London Times*.

SCIENTIFIC BOOKS

Studies on some Flagellates. E. PENARD.
Proc. Acad. Nat. Sci. Phila., 1921, Part 1,
Oct. 12. Idem, Etudes sur les Infusoires
d'eau douce; Geneva, "1922" [1921].

The inadequacy of our knowledge of local protozoan faunas is emphasized by two recent papers by the veteran Swiss protozoologist, Penard, in which he describes, chiefly from two limited regions in the environs of Geneva, 7 new Flagellates and 148 new species of Ciliates, including 8 new genera. Central Europe has been more intensively studied faunistically than any other portion of the world, yet six years observation by one student has brought to light 155 new forms in groups which are the especial delight of the microscopist and which have been by no means neglected by the protozoologist. Faunistic data furnish material essential to the study of many far-reaching problems in ecology, in distribution, in geology, and especially in paleogeography. Yet it is evident, from such papers as Penard's, that our faunistic data for all regions are only fragmentary.

Many of Penard's papers, like those of Leidy, show an intimate and friendly companionship with these microscopic forms, being full of data as to behavior, structure and function being described together, conveying to the reader a vivid impression of the lives of these organisms and showing an interest on the part of the observer which is contagious. May it not be that laboratory zoology is to-day disproportionately emphasized in comparison with out of door studies? A broad knowledge of field natural history, combining taxonomic, faunistic and ecological studies and studies of behavior under natural environmental conditions, is essential to any adequate attack upon many problems, among which are some of the most interesting in the whole field of zoology. This is a type of work to which it is easy to introduce young students and it is one to which a fair proportion of them could well afford to devote their lives, for evidently our knowledge in this field is most inadequate. The field, while easy to enter, calls for the finest qualities of skill, accuracy, persistence and judgment. It commands a natural interest and it gives data of wide bearing.

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